Land Use and Environmental Service Agency
(Code Enforcement)

NC Mechanical Code

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306.5 - Question: Would solar panels installed on a roof that is over 16 feet in height require an access ladder when solar panels would not require periodic maintenance?

Answer: No, the key phrase is periodic maintenance. Section 306.5 states equipment and appliances requiring periodic maintenance installed on roofs over 16 feet require permanent means of access.

306.5 Equipment and appliances on roofs or elevated structures. Where equipment and appliances requiring periodic maintenance are installed on roofs or elevated structures at a height exceeding 16 feet (4877 mm), such access shall be provided by a permanent approved means of access, the extent of which shall be from grade or floor level to the equipment and appliances' level service space.

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Such access shall not require climbing over obstructions greater than 30 inches (762 mm) high or walking on roofs having a slope greater than four units vertical in 12 units horizontal (33-percent slope). Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.

307 - Question: What is the proper size of a condensate line connecting multiple condensate drains into a single header?

Answer: Residential (3 to 5 tons)

• Increase pipe size each time you add additional unit up to 1 ½ inch pipe size.

Commercial

• Increase pipe size each time you add additional unit up to 2 inch pipe size.

Example: 3 units are to be manifolded together. After the first 2 are combined, the pipe size will increase to 1 inch. After the third is tied in, the pipe size will increase to 1 1/4 inch.

307.2.2 - Question: Is PVC condensate piping required to be primed and glued?

Answer: Yes, Section 307.2.2 refers to Chapter 7 of the plumbing code for joints and connections, which does require PVC joints to be primed and glued.

307.2.2 Drain pipe materials and sizes. Components of the condensate disposal system shall be cast iron, galvanized steel, copper, cross-linked polyethylene, polybutylene, polyethylene, ABS, CPVC or PVC pipe or tubing. All components shall be selected for the pressure and temperature rating of the installation. Joints and connections shall be made in accordance with the applicable provisions of Chapter 7 of the International Plumbing Code relative to the material type. Condensate waste and drain line size shall be not less than 3/4-inch (19 mm) internal diameter and shall not decrease in size from the drain pan connection to the place of condensate disposal.

Plumbing Code Reference:

705.14 PVC plastic. Joints between PVC plastic pipe or fittings shall comply with Sections 705.14.1 through 705.14.3.

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705.14.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A purple primer or an ultraviolet purple primer that conforms to ASTM F 656 shall be applied. When an ultraviolet primer is used, the installer shall provide an ultraviolet light to the inspector to be used during the inspection. Solvent cement not purple in color and conforming to ASTM D 2564, CSA-B137.3, CSA B181.2 or CSA B182.1 shall be applied to all joint surfaces.

The joint shall be made while the cement is wet and shall be in accordance with ASTM D 2855. Solvent-cement joints shall be permitted above or below ground.

307.2.3 - Question: Is a float switch or auxiliary pan required for an air handler sitting on a wood floor?

Answer: Yes, Section 307.2.3 requires an auxiliary system where damage to the building components could occur. This can be accomplished with any of the 4 options in 307.2.3.

307.2.3 Auxiliary and secondary drain systems. In addition to the requirements of Section 307.2.1, where damage to any building components could occur as a result of overflow from the equipment primary condensate removal system, one of the following auxiliary protection methods shall be provided for each cooling coil or fuel-fired appliance that produces condensate:

1. An auxiliary drain pan with a separate drain shall be provided under the coils on which condensation will occur. The auxiliary pan drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The pan shall have a minimum depth of 11/2 inches (38 mm), shall not be less than 3 inches (76 mm) larger than the unit or the coil dimensions in width and length and shall be constructed of corrosion-resistant material. Galvanized sheet steel pans shall have a minimum thickness of not less than 0.0236 inch (0.6010 mm) (No. 24 gage). Nonmetallic pans shall have a minimum thickness of not less than 0.0625 inch (1.6 mm).

2. A separate overflow drain line shall be connected to the drain pan provided with the equipment. Such overflow drain shall discharge to a conspicuous point of

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disposal to alert occupants in the event of a stoppage of the primary drain. The overflow drain line shall connect to the drain pan at a higher level than the primary drain connection.

3. An auxiliary drain pan without a separate drain line shall be provided under the coils on which condensate will occur. Such pan shall be equipped with a water-level detection device conforming to UL 508 that will shut off the equipment served prior to overflow of the pan. The auxiliary drain pan shall be constructed in accordance with Item 1 of this section.

4. A water-level detection device conforming to UL 508 shall be provided that will shut off the equipment served in the event that the primary drain is blocked. The device shall be installed in the primary drain line, upstream of the primary drain line trap, the overflow drain line, or in the equipment-supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.

400 Chapter 4 Ventilation

403.3 - Question: Is an exhaust fan required in a bathroom that only has a lavatory installed in it?

Answer: No, if the room only has a lavatory then it is neither a toilet room nor a bathroom and would not require exhaust per Table 403.3

BATHROOM. A room containing a bathtub, shower, spa or similar bathing fixture.

TOILET ROOM. A room containing a water closet and, frequently, a lavatory, but not a bathtub, shower, spa or similar bathing fixture.

403.3 - Question: Can a ductless (Charcoal Filter) exhaust fan be installed in a half bath (lavatory and water closet only)?

Answer: No, this would be a toilet room and would be require to provide exhaust per Table 403.3

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403.9 - Question: I am being told that I cannot use the coupling that comes with the gas pipe, why is this?

Answer: Section 403.9 requires metallic pipe and fitting threads to be tapered. These merchant couplings are straight threads and are used to protect the threads during shipping. A standard black steel coupling is made of malleable steel, where the merchant couplings are made from steel tubing and can split. 403.9 Metallic pipe threads. Metallic pipe and fitting threads shall be taper pipe threads and shall comply with ASME B1.20.1

500 Chapter 5 Exhaust Systems

502.14 - Question: Section 502.14 NCMC requires a source capture system where stationary motor vehicles are operated. What are the termination requirements for this system?

Answer: Section 501.2.1 provides the requirements for various types of exhaust. The exhaust from a source capture would not be considered flammable, nor would it be considered environmental air. Therefore source capture exhaust outlets would have to comply with 501.2.1 #2.
10 feet from property lines
3 feet from exterior walls and roofs
10 feet from operable openings into buildings
10 feet above adjoining grade
501.2.1 Location of exhaust outlets. The termination point of exhaust outlets and ducts discharging to the outdoors shall be located with the following minimum distances:

1. For ducts conveying explosive or flammable vapors, fumes or dusts: 30 feet (9144 mm) from property lines; 10 feet (3048 mm) from operable openings into

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buildings; 6 feet (1829 mm) from exterior walls and roofs; 30 feet (9144 mm) from combustible walls and operable openings into buildings which are in the direction of the exhaust discharge; 10 feet (3048 mm) above adjoining grade.

2. For other product-conveying outlets: 10 feet (3048 mm) from the property lines; 3 feet (914 mm) from exterior walls and roofs; 10 feet (3048 mm) from operable openings into buildings; 10 feet (3048 mm) above adjoining grade.

3. For all environmental air exhaust: 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable openings into buildings for all occupancies other than Group U, and 10 feet (3048 mm) from mechanical air intakes. Such exhaust shall not be considered hazardous or noxious.

4. Exhaust outlets serving structures in flood hazard areas shall be installed at or above the design flood level.

5. For specific systems see the following sections:

5.1. Clothes dryer exhaust, Section 504.4.

5.2. Kitchen hoods and other kitchen exhaust equipment, Sections 506.3.12, 506.4 and 506.5.

5.3. Dust stock and refuse conveying systems, Section 511.2.

5.4. Sub slab soil exhaust systems, Section 512.4

5.5. Smoke control systems, Section 513.10.3

5.6. Refrigerant discharge, Section1105.7

5.7. Machinery room discharge, Section 1105.6.1

504.5 - Question: I have a laundry room that is bigger than a closet, am I still required to provide make up air?

Answer: It will depend on the laundry room size. If it meets the requirements of R304.3 for minimum habitable room dimensions, then make up air would not be

required. If the room does not meet the minimum dimensions, then it would be required per 504.5 NCMC.

R304.3 Minimum dimensions. Habitable rooms shall not be less than 7 feet in any horizontal dimension.

504.5 Makeup air. Where a closet is designed for the installation of a clothes dryer, an opening having an area of not less than 100 square inches (0.0645 m2) shall be provided in the closet enclosure or makeup air shall be provided by other approved means.

504.6.5 - Question: I was turned down for not having a permanent label stating the length of the dryer duct, but I did not exceed the 35 feet. Isn't the label only if you go over what code allows?

Answer: In the 2009 NCMC the requirement for a label was an exception to the maximum dryer exhaust length, providing the manufacture supported the length. In the 2012 NCMC, the label requirement was moved to a stand alone section and is a requirement for all dryer exhaust installations.

504.6.5 Length identification. The equivalent length of the exhaust duct shall be identified on a permanent label or tag. The label or tag shall be located within 6 feet (1829 mm) of the exhaust duct connection.

504.7 - Question: What are the venting requirements for a Type 2 dryer?

Answer: Most of the venting requirements will be per the manufacture's installation instructions. However there a few requirements per Section 504.7 NCMC.

1. Exhaust fan motors installed in the exhaust system shall be outside of the air stream
2. When multiple dryers are manifolded together, the fan shall run continuously or be interlocked to operate when any individual unit is operating.
3. Ducts shall have a minimum clearance of 6 inches

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4. Transition ducts connecting the appliance to the exhaust system shall not exceed 8 feet
5. Transition ducts shall be listed and labeled for the application
6. Transition ducts shall not be concealed within construction

504.7 Commercial clothes dryers. The installation of dryer exhaust ducts serving Type 2 clothes dryers shall comply with the appliance manufacturer's installation instructions. Exhaust fan motors installed in exhaust systems shall be located outside of the airstream. In multiple installations, the fan shall operate continuously or be interlocked to operate when any individual unit is operating. Ducts shall have a minimum clearance of 6 inches (152 mm) to combustible materials. Clothes dryer transition ducts used to connect the appliance to the exhaust duct system shall be limited to single lengths not to exceed 8 feet (2438 mm) in length and shall be listed and labeled for the application. Transition ducts shall not be concealed within construction.

505.2 - Question: It was my understanding that I could go up to 600 cfm on domestic kitchen hoods before I had to provide makeup air, but I was told I had to provide it because the house had a fireplace. Is this correct?

Answer: Yes, there was a code change that allows domestic exhaust hoods that do not exceed 600 cfm to be installed without providing makeup air. There is a stipulation, all the appliance in the house have to be direct-vent, power-vent, unvented or electric. The fireplace is not a direct vent.
See attached code reference and flow chart.

507.9 - Question: Why is PVC in the wall still counted as a combustible behind a Type I hood?

Answer: Per NCDOI (Dan Dittman), they interpret it the same way we do. Combustibles must be 18 inches from the hood, the sheetrock does not reduce the clearance requirements. The only ways to reduce the 18 inches is to use Table 308.6 NCMC or have a reduced clearance hood.

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507.9 Clearances for Type I hood. A Type I hood shall be installed with a clearance to combustibles of not less than 18 inches (457 mm).

600 Chapter 6 Duct Systems

603.6.1 - Question: I was turned down for using aluminum flex for the make up air duct on my factory built fire place. The manufacture instructions just states to use flex. Why was I turned down?

Answer: Section 603.6.1 NCMC states flexible air ducts, both metallic and nonmetallic must be tested in accordance with UL181. It appears there are several manufacturers of this flexible aluminum duct, which has not been tested in accordance with UL181.

603.7 - Question: Can fire dampers be used in a residential garage supplied with air from outside the area where cars are parked?

Answer: No, Section 603.7 prohibits the openings into the garage. The separation of the garage is one issue the other is the transfer of CO or other fumes from the garage to the living space, which a fire damper cannot offer protection.
603.7 Rigid duct penetrations. Duct system penetrations of walls, floors, ceilings and roofs and air transfer openings in such building components shall be protected as required by Section 607. Ducts in a private garage and ducts penetrating the walls or ceilings separating a dwelling unit from a private garage shall be continuous and constructed of a minimum 26 gage [0.0187 inch (0.4712 mm)] galvanized sheet metal or other approved noncombustible material and shall not have openings into the garage. Fire and smoke dampers are not required in such ducts passing through the wall or ceiling separating a dwelling unit from a private garage except where required by Chapter 7 of the International Building Code.

700 Chapter 7 Combustion Air

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800 Chapter 8 Chimneys & Vents

900 Chapter 9 Specific Appliances

1000 Chapter 10 Boilers & Water Heaters

1100 Chapter 11 Refrigeration

1200 Chapter 12 Hydronic Systems

1300 Chapter 13 Fuel Oil Piping

1400 Chapter 14 Solar Systems

Policy - Question: Who looks at factory built fire places? The Building Inspector or the Mechanical Inspector?

Answer: Both will look at it. The Building Inspector will inspect the unit for clearances to combustibles and the Mechanical Inspector will inspect the vent, combustion air (if applicable) and the gas line (if applicable).

Policy

Policy - Question: What is the minimum depth allowed for a return box with a filter grill?

Answer: There needs to be at least 12" depth measured from the back of the filter grill and the back of the box where the starting collar is connected. Depths

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less than the 12" would create excessive turbulence and would not meet SMACNA standards.

This has been our policy since atleast 2002, can be found in the 2002 Q&A

Policy - Question: Why can I not terminate the dryer vents in the breezeway of the apartments? It is outside the building.

Answer: Section 504.4 states the dryer exhaust "shall terminate outside of the building". The breezeway is under roof and by the definition in the NCBC, is considered part of the building area. Our policy requires dryer vents and exhaust terminations be outside of the building. Examples are breezeways, balconies above, loading docks, etc.

AREA, BUILDING. The area included within surrounding exterior walls (or exterior walls and fire walls) exclusive of vent shafts and courts. Areas of the building not provided with surrounding walls shall be included in the building area if such areas are included within the horizontal projection of the roof or floor above.

504.4 Exhaust installation. Dryer exhaust ducts for clothes dryers shall terminate on the outside of the building and shall be equipped with a backdraft damper. Screens shall not be installed at the duct termination. Ducts shall not be connected or installed with sheet metal screws or other fasteners that will obstruct the exhaust flow. Clothes dryer exhaust ducts shall not be connected to a vent connector, vent or chimney. Clothes dryer exhaust ducts shall not extend into or through ducts or

plenums.

Policy - Question: What are the permit requirements for installing a PTAC unit?

Answer: John Todaro with the State Board of Examiners of Plumbing and Heating Contractors, has confirmed there is no license requirements for the installation of a PTAC unit for single family. For commercial they count toward the total building cooling load which will determine the class of license required.

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With no license requirements for single family, the minimum permits required for a new installation for single family is a Building permit for cutting the hole in the wall and installation of the header; and an electrical permit if a new circuit has to be run for the unit.
There is an issue when someone wants to count the space as heated square footage. To count the space as heated square footage, a mechanical permit must be issued to document a permanent heat source. Most of the time, these PTAC units are installed by HVAC companies, therefore we are giving an OPTION of pulling a mechanical permit if the homeowner wants the space classified as heated. The contractor will affirm the unit is sized properly for the space and this will be documented with the mechanical permit

Other - R303.3 - <u>Question:</u> Can I use a window in lieu of a bath fan in a residential bathroom?

<u>Answer:</u> Yes in a single family, two-family or townhouse; you are allowed to use a minimum of a 3 square foot window, which one-half must be openable.
R303.3 Bathrooms. Bathrooms, water closet compartments and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 square feet, one-half of which must be openable.

Exception: The glazed areas shall not be required where artificial light and an mechanical ventilation system are provided. The minimum ventilation rates shall be 50 cubic feet per minute for intermittent ventilation or 20 cubic feet per minute for continuous ventilation. Ventilation air from the space shall be exhausted directly to the outside.

<u>Other</u>

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Other - Question: I have been told that I cannot use the self adhesive labels for gas piping with counter strike CSST, why?

Answer: The manufacturer of counter strike does not allow the use of self adhesive labels, it counter acts the jacket and produces a point of concentration for electrical surges, instead of dispersing them. The manufacture requires the use of special metal tags for use with counter strike.

Energy Code (403.1.1 NCECC/N1103.1.1 NCRC) - Question: Does a heat pump require a programmable thermostat? If NOT why?

Answer: No, per NCDOI informal interpretation:
The forced air-furnaces subject to the requirements of 403.1.1 are oil-fired furnaces, electric furnaces (strip heat only), solid fuel furnaces, and fuel-gas furnaces. As heat pumps have their own definition (see definitions, NCMC chapter 2, furnace, heat pump), the more specific requirement of section 403.1.2 shall apply to a heat pump.

Other - Question: Is it permissible to route refrigerant or condensate line in a residential elevator shaft? (single family)

Answer: We cannot find any code that prohibits routing refrigerant or condensate lines in a elevator shaft in a single family home. If the manufacturer of the elevator doesn't prohibit it, then we see no reason it would not be allowed.